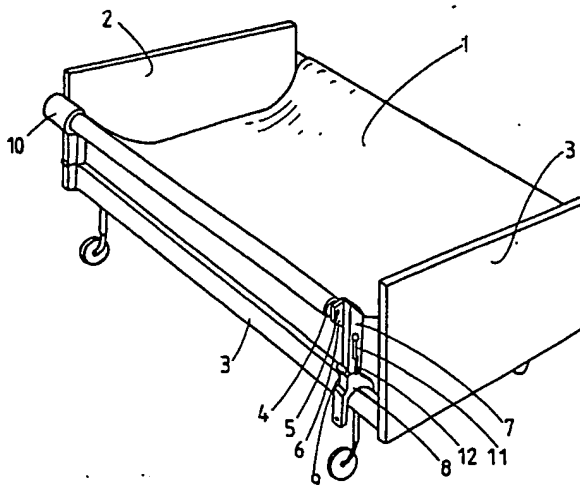




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: DEVICE FOR BEDS FOR TURNING OF PATIENTS



## (57) Abstract

A bed, particularly a hospital or a nursing home bed, which comprises a sheet (1) arranged between two rollers with two opposite sides or end portions of the sheet each being wound around one of the two rollers, and where a drive means is associated with each of the rollers serving to rotate the single rollers to wind the sheet from one roller to the other particularly as to provide a turning of a person laying on the sheet. To achieve a reduced nursing staff help during leaving and entering the bed the sheet rollers (4) at each of their ends are bearing supported (5, 6) on stanchions (7, 8) which are provided with at least one hinge means (9) enabling a lifting and lowering of the bearing supports (5, 6) by being turned around the hinge means (9). The hinge means (9) may be combined with a slidable locking mechanism comprising a locking brick (16) able to be held in position by means of a gripping or fixation means (12). The single stanchions (7, 8) or both of them may be of the telescopic kind.

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Device for beds for turning of patients.

The present invention relates to a bed, particularly hospital or nursing home bed, comprising a sheet arranged between two rollers with two opposite sides or end  
5 portions of the sheet each being wound around one of the two rollers of which each is associated with a drive means, particularly an electromotor drive means, serving to rotate the rollers to wind the sheet from one roller to the other in either direction, particularly as to provide  
10 a turning of a person laying on the sheet.

It thus belongs to the state of the Art to accommodate hospital or nursing home beds so that the sheet, on which a patient, who is suffering from impairment of the organs of movement, or at a nursing home a person, who  
15 only may move with difficulty, f.i. due to spastic paralysis, is laying, when being moved across the bed provides a turning of this person. A prerequisite for the providing of such a turning is that the rollers have to be positioned at suitable high levels over the bed in  
20 proportion to the place where the person is laying on the sheet.

Besides the attained advantage this solution results in some drawbacks, namely that on the one hand the rollers should be positioned at fairly low levels over the bed to  
25 permit the nursing staff to get access to the person in the bed and on the other hand in relation to the drive mechanisms which of practical reasons shouldn't be positioned at too high levels over the bed because then the drive mechanisms also present hindernisses to the  
30 access to the bed as the drive mechanisms after all take up fairly large portions of space.

The present invention has the purpose to improve these conditions. According to the invention this is attained in the way that the sheet rollers at each of

their ends are bearing supported on stanchions which are provided with at least one hinge means enabling a lifting and lowering of the bearing supports by being turned around the hinge means.

5       At a further development hereof, to achieve a better fastening of the hinge means, the hinge means are combined with a slidable locking mechanism comprising a locking  
10       brick which by means of a gripping or fixation means can be held in position at at least one of the slidable  
10       positions. Such a gripping or holding means can be a spring loaded snap lock means or can be a manually acti-  
vatable spanning means, which f.i. by means of a spanning  
means of the screw type holds the movable parts against  
each other.

15       An alternative embodiment which may be advantageous in that larger or lesser movability of the rollers by the use of the hinge means may be achieved according to the invention consists in that the hinge means are positioned for the hinging together of stanchion portions of which one  
20       portion or both portions is (are) of the telescopic kind.

Embodiments according to the invention are described in more details in the following under reference to the drawing, wherein:

25       Figure 1 in the perspective illustrates a bed equipped with a device according to the present invention,

Figure 2 in the perspective shows the device according to Figure 1, but not being mounted on a bed,

30       Figure 3 illustrates the same as Figure 2, but illustrating the rollers when positioned at a lower position,

Figure 4 and 5 show a combined embodiment of a hinge or slidable mechanism as viewed from the end  
35       and being viewed in direction of the axis of

the associated roller, and

Figure 6 illustrates a slidable locking means viewed in vertical cross section through a hinge means with horizontal axis and being shown with the associated roller occupying the upper position.

In the single Figures of the drawing same parts or items having corresponding functions are designated with the same sign of reference.

To illustrate the usefulness of the invention a device according to the invention, as an example, in Figure 1 is shown in the perspective being attached to f.i. a rollable bed with end portions 2 and side portions 3 of which only one is visible in Figure 1. Resting on the side portions 3 by means of f.i. fork shaped holding means for the purpose being lockable to the side portions of the bed by means of securing screws or pins 14, being insertable under the side portions 3 of the bed through holes 13 in the holding means, stanchions 7, 8 are mounted which carry bearing means for bearing pins 5 on the end of the two rollers 4 around which, as described above, the side portions of a sheet 1 which stretches across the bed are wound. The rollers 4 are rotatably positioned and may be driven by means of drive means 10 with f.i. one drive means for each roller. The drive means may be of any kind, manual as well as hydraulic, pneumatical or electric. They ought to be of the kind which completely or in part provide self locking, when not rotating, so that the sheet 1 stretched may be hold in a chosen wound condition by the rollers 4.

The idea behind the device according to the invention is to improve such a roller device so that it without the handling of a motor is possible in a relatively simple way without exerting too much muscle power to lower and lift any of the roller means, whereby a person easily may be

brought in and out from the bed. It is remarked, that beds in hospitals and nursing homes often are substantially higher than beds which are used in private homes. That is because the nursing staff then in more comfortable positions may be able to take care of the patients. The known roller devices also suffer from the drawback that they are inconvenient for the persons in the beds when he or she has to be brought out from or into the bed as too much handling work is required often involving more persons of the nursing staff for the purpose.

In the basic embodiment the device according to the invention consists of a hinge means 9 with preferably, but not necessarily, horizontal axis of hinging for the linking together of the two stanchion portions 7 and 8 which are sitting on fork shaped holding means. A simple locking device, f.i. a hook type locking device, could be arranged to keep the stanchion portions 7 and 8 held in position in one or more of their working positions. The advantage provided by the hinge means is that the sheet 1 not has to be handled in relation to the rollers 4 to bring the rollers to occupy a suitable position enabling an easy getting out from and into the bed.

In the Figures 2 and 3 the same device as the one shown in Figure 1 is illustrated, but without the bed. In Figure 2 the device is shown in the same position as in Figure 1, whereas the device in Figure 3 is illustrated with the hinge means occupying lowered positions.

Fig. 6 illustrates a cross section through a stanchion 7, 8 shown in the same position as shown in Figure 2 respectively in Figure 1. It is seen, that the stanchion portions 7 and 8 internally are hollow. In Figure 3 the hollowness 15 of the portion 8 can also be seen. In the stanchions 7, 8 a slidable locking means which comprises a preferably in the hollowness of the stanchion 7 and in the hollowness 15 of the stanchion 8 thus

up and down slidable locking brick 16 which here is shown comprising a guiding or threaded hole for a gripping or holding means 12 carrying an external handle which handle easily is visible in Figure 1, Figure 2 and Figure 3. In 5 the side of the stanchion portion 7 f.i. a key hole like aperture 11 is comprised which is clearly visible in these Figures and in dotted lines is shown in Figure 6 as it in this Figure is laying in front of or behind the cross sectional plane. The gripping or holding means 12, it is 10 here thought, comprises a threaded pin which it is possible to screw into the locking brick 16 through the aperture 11. When the locking brick occupies the position shown in Figure 6 a thicker portion of the gripping or holding means may be screwed into the broadest portion of the key hole 15 like aperture 11 and hold the locking brick fixed against any sliding of it, i.e. in the position shown in Figure 6, so that movements of the hinge means unobstructed may take place. By sliding the locking brick downwards, after having loosened the gripping or holding means 12, within the 20 hollowness 15 to occupy the position according to Figure 6 the portions 7 and 8 unshakeably are held towards each other. This arrangement may also be used if the portions 7 and/or 8 comprise(s) telescopic shaped wall portions.

In Figure 4 of the drawing an alternative embodiment 25 of the hinge means 9 is shown by which also, in case of further holding means of per se well known kind being present, an upwards and downwards sliding independent of the hinge means movement is made possible. The hinge means 9 is here substituted by a horizontal pin 19 which by not 30 further described side portions fastened to the stanchion 7 is kept in position. Through the opening between the pin 19 and the stanchion 7 a hook like member 20 with a hooked end 21 to grip around the pin 19 is stuck whereby the member 20 is sitting held unto the stanchion portion 35 7. The vertical length of the pin 19 above the top of the

stanchion portion 8 determines how much the stanchion portion 7 may be lowered in relation to the stanchion portion 8 and herewith in relation to the bed. A grooved member 22 sitting on the stanchion portion 8 holds the hooked end 21 fixed when the stanchion portion 7 occupies vertical position. Also other kinds of with the hinge means 9 cooperating upwards and downwards slidability of the portion 7 in relation to the portion 8 are thinkable, here among also corresponding members which permit an oblique sliding in stead of an upwards and downwards sliding. It is thus remarked, that the length of the hooke like member 20 between the portion 7 and the grooved member 22 makes an oblique sliding between the portion 7 in relation to the portion 8 possible dependent on the actual length of the lengthy item 20.

A similar embodiment as that shown in Figure 4 is shown in Figure 5. The grooved member 22 is here substituted by f.i. the upper edge of the stanchion portion 8 with which a hooked member 23 on the stanchion portion 7 may be brought to pending grip at not-kipped-out position of the stanchion portion 7.



## C L A I M S

1. Bed, particularly hospital or nursing home bed,  
comprising a sheet (1) arranged between two rollers with  
two opposite sides or end portions of the sheet each being  
5 wound around one of the two rollers of which each is  
associated with a drive means, particularly an electromo-  
tor drive means, serving to rotate the rollers to wind the  
sheet from one roller to the other in either direction,  
particularly as to provide a turning of a person laying on  
10 the sheet, c h a r a c t e r i z e d i n t h a t  
the sheet rollers (4) at each of their ends are bearing  
supported (5, 6) on stanchions (7, 8) which are provided  
with at least one hinge means (9) enabling a lifting and  
lowering of the bearing supports (5, 6) by being turned  
15 around the hinge means (9).

2. Bed according to claim 1 c h a r a c t e r i -  
z e d i n t h a t the hinge means (9) are combined  
with a slidable locking mechanism comprising a locking  
brick (16) which by means of a gripping or fixation means  
20 (12) can be held in a position at at least one of the  
slidable positions.

3. Bed according to claim 1 or 2 c h a r a c t e -  
r i z e d i n t h a t the hinge means (9) are posi-  
tioned for the hinging together of stanchion portions (7,  
25 8) of which one portion or both portions is (are) of the  
telescopic kind.

## AMENDED CLAIMS

[received by the International Bureau on 07 November 1985 (07.11.85);  
original claims 1-3 replaced by new claims 1-4 (2 pages)]

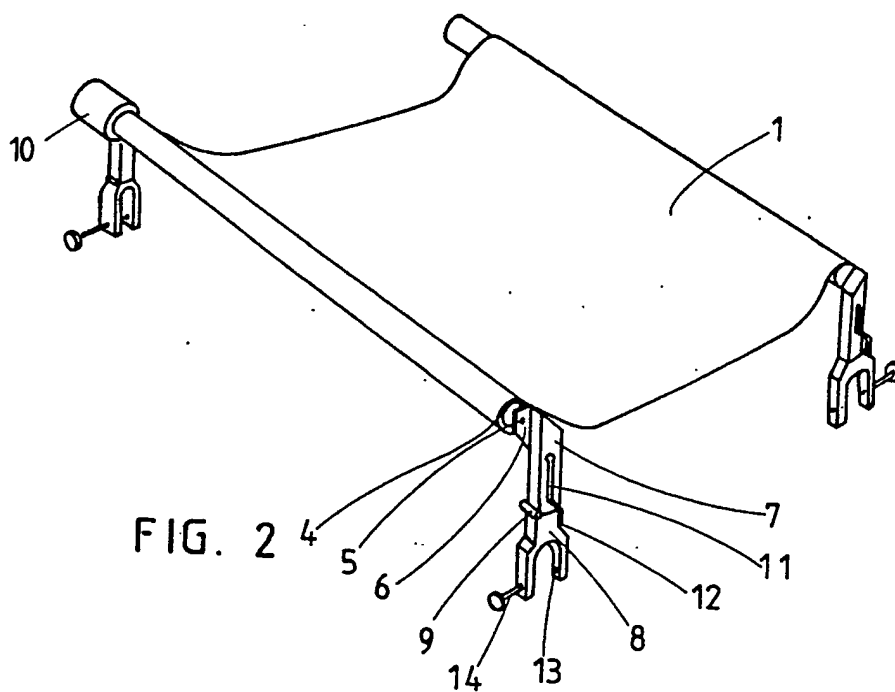
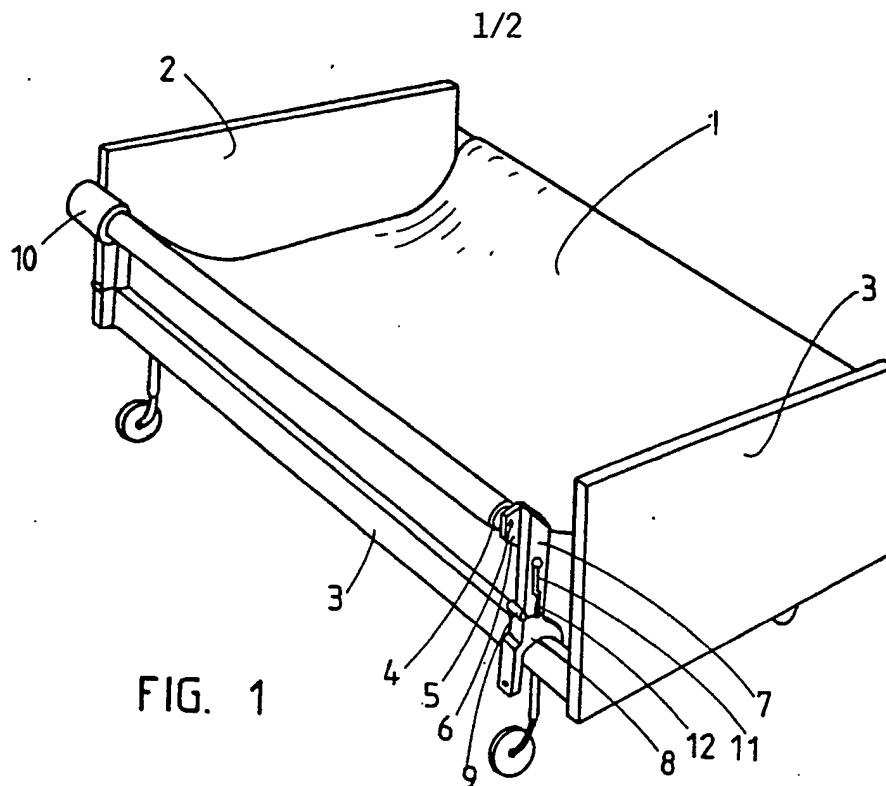
1. Bed, particularly hospital or nursing home bed,  
comprising a sheet (1) arranged between two rollers with  
two opposite sides or end portions of the sheet each being  
5 wound around one of the two rollers of which each is  
associated with a drive means, particularly an electromo-  
tor drive means, serving to rotate the rollers to wind the  
sheet from one roller to the other in either direction,  
particularly as to provide a turning of a person laying on  
10 the sheet, c h a r a c t e r i z e d i n t h a t  
the sheet rollers (4) at each of their ends are bearing  
supported (5, 6) on stanchions (7, 8) which are provided  
with at least one hinge means (9), particularly at the  
side portions of the bed, enabling a lifting and lowering  
15 of the bearing supports (5, 6) by being turned around the  
hinge means (9).

2. Bed according to claim 1 c h a r a c t e r i -  
z e d i n t h a t the hinge means (9) are combined  
with a slidable locking mechanism comprising a locking  
20 brick (16) which by means of a gripping or fixation means  
(12) can be held in a position at at least one of the  
slidable positions.

3. Bed according to claim 1 or 2 c h a r a c t e -  
r i z e d i n t h a t the hinge means (9) are posi-  
25 tioned for the hinging together of stanchion portions (7,  
8) of which one portion or both portions is (are) of the  
telescopic kind.

4. Bed according to claim 1, 2 or 3 c h a r a c -  
t e r i z e d i n t h a t the stanchions (7, 8)  
30 preferably are positioned in vicinity of the ends of the  
side portions of the bed, that the bearing supports (5,  
6) on the stanchions (7, 8) are thus positioned sideways-  
ly in relation to the longitudinal axes of the stanchions  
(7, 8) that the bearing supports (5, 6) occupying lowered

position after being turned around the hinge means (9) are, located just substantially swung in below or are brought to be located somewhat longer in below or totally passed in below the side portions of the bed.



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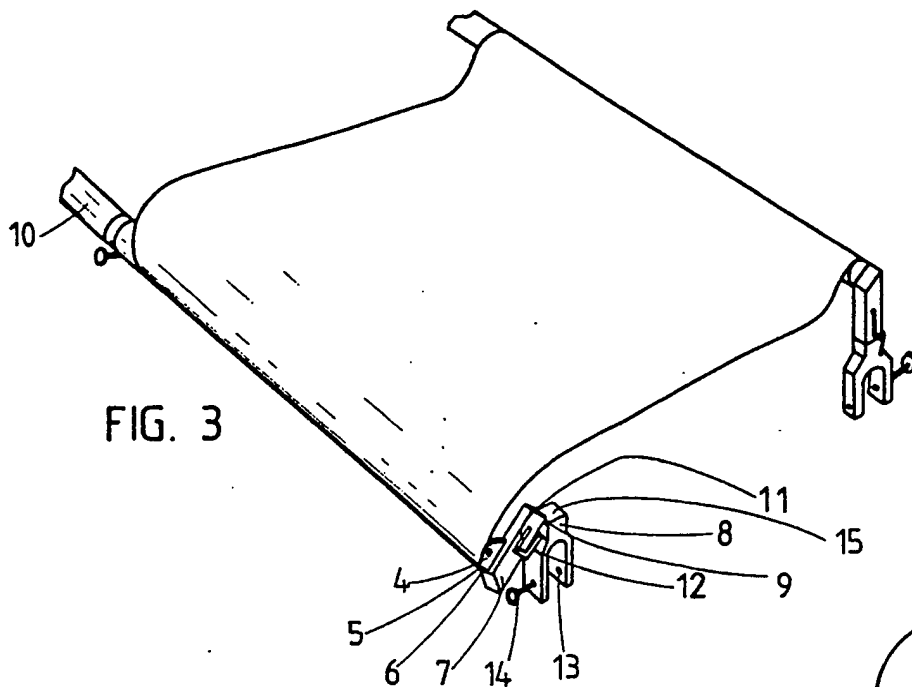


FIG. 3

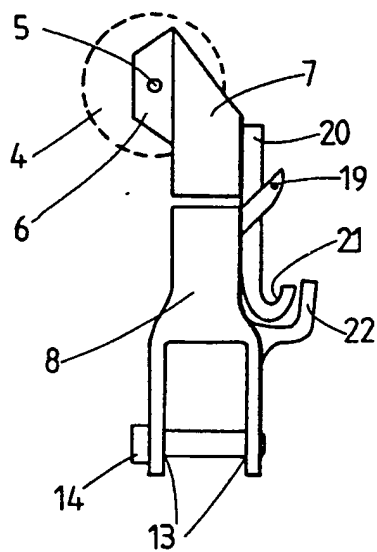


FIG. 4

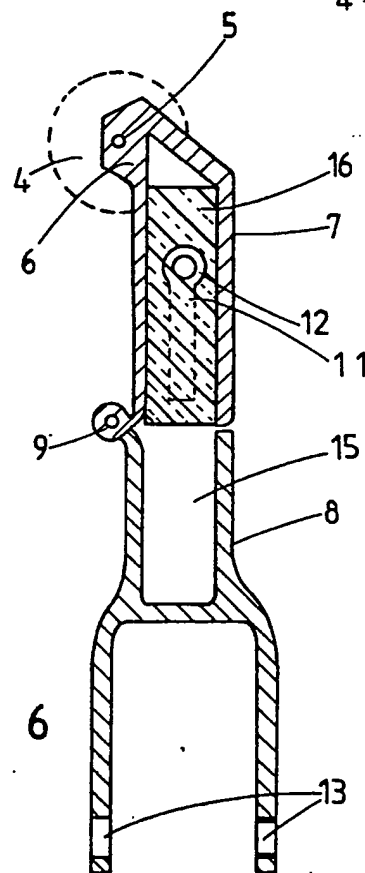
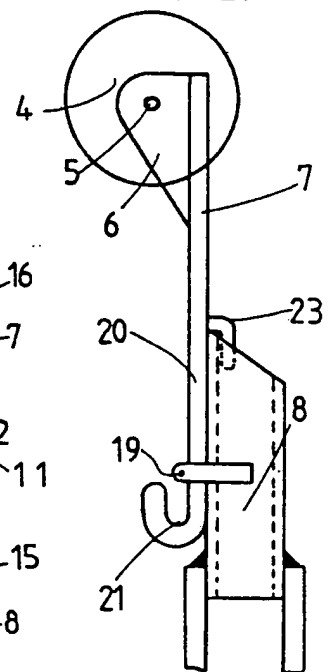


FIG. 6

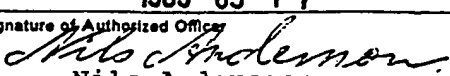
FIG. 5



# INTERNATIONAL SEARCH REPORT

International Application No

PCT/DK85/00061

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) *		
According to International Patent Classification (IPC) or to both National Classification and IPC 4		
A 61 G 7/10		
<b>II. FIELDS SEARCHED</b>		
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Classification System	Classification Symbols	
IPC4 US C1	A 61 G 7/10, 12/00; B 65 G 7/08 5:60-62, 83-85, 87-89	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched 8		
SE, NO, DK, FI classes as above		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT</b> 9		
Category *	Citation of Document, 11 with indication, where appropriate, of the relevant passages 12	Relevant to Claim No. 13
Y	SE, C, 118 877 (O A E LITHANDER ET AL) 27 May 1947	1
Y	SE, B, 413 737 (7800612-9) (K J G HOLMSTRÖM) 23 June 1980	1
Y	GB, A, 23 941 (A D 1911) (A SKEFFINGTON) 6 December 1911	1
A	GB, A, 6 487 (A D 1913) (A R GROOME) 15 March 1913	2
Y	GB, A, 2 102 675 (T PERSSON) 9 February 1983 & DE, 3227384 SE, 8204397 AU, 86387/82 JP, 58029460 JP, 12975282 US, 4502169  .../...	1
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>* Special categories of cited documents: 10</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&amp;" document member of the same patent family</p> </div> </div>		
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1985-09-12	1985-09-17	
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III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
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Y	US, A, 749 014 (P W ATKINSON) 5 January 1904	1